

NOTES ON A COLLECTION OF ECHINODERMATA
FROM AUSTRALIA.

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One of the most solid and gratifying "results" of the Great International Fisheries Exhibition held in London in 1883, were the lessons zoologists learnt in the "New South Wales Court." Speaking here only of the department in which I take the greatest interest I have to express my thanks to the authorities in Sydney for sending over to this country one who displayed so generous a disposition as Mr. Ramsay; to this gentleman's kindness I owe the opportunity of going through an excellent collection of Australian Echinodermata; but I greatly regret that the rarer species of which he had only single specimens could not be left in my hands a little longer.

I have thought there might be some slight return on my part if I were to offer to the Linnean Society of New South Wales a systematic list of the species which I was able to determine, as a slight and preliminary contribution to a knowledge of the fauna of Australian Seas, and I only regret that prior engagements compel me to refrain from the discussion here of the kind of problems which had already been suggested to me by a study of the very magnificent collections made by Dr. Coppinger of the H.M.S. Alert. To the report on that collection, now shortly to be published* I must refer the student for details, descriptions of new species, and bibliographical references

* As a Catalogue of the British Museum, where the Report on the Echinodermata will occupy pp. 117-177.

After the list of the species of each class, I have added a few notes on those that have seemed to me to be of special interest or importance.

Here one general remark need alone be made ; the collections before me show that within a short distance of the meeting place of the Linnean Society, there is a bay teeming with species and individuals. The exact knowledge of the fauna of a given region—in other words a correct and full enumeration of the species—is a matter of considerable importance, but one cannot insist too often, too unweariedly, and even too fanatically on the great, though not always clearly perceived, truth that we are not a little like those who beat the air when we add species to species and genus to genus, and yet know of these nothing more than is sufficient to justify our framing our diagnoses. The knowledge of the variations during growth, of the variations due to slight alterations in the surroundings of the proportional frequency of individuals, and of the relation of species to one another will afford a firmer base for systematic work than synonymic catalogues or nominal check-lists.

The student who lives at Port Jackson might well take this truth to heart, for he lives in a region in which the number of individuals of certain species is sufficient for all the purposes just indicated.

DIVISION. PELMATOZOA.

CLASS. CENIOIDEA.

1. *Antedon milberti*.
Port Denison, Port Molle.
2. *Antedon marionema*.
Port Stephens.
3. *Antedon spicata*. (P. H. Carpenter. Notes Leyden Museum, III., p. 190.
Ugi.
4. *Antedon* sp. Allied to but not the same as *A. spicata*.
Ugi.

*5. *Antedon pumila*.
Nelson's Bay, Port Stephens.

6. *Actinometra solaris*.

*7. *Actinometra intermedia*.
Port Molle.

8. *Actinometra jukesi*. (P. H. Carpenter, Proc. Royal Soc., 1879, p. 390.)
Port Molle.

Together with several species of *Antedon*, hitherto undescribed, but here unfortunately represented by single, not always perfect, specimens.

DIVISION. ECHINOZOA.

CLASS. ASTEROIDEA.

1. *Asterias calamaria*.
Tasmania.
2. *Echinaster purpurea*.
Port Molle.
3. *Linckia marmorata* (?)
Port Molle ; (of Alert report.)
4. *Stellaster incei*.
Port Molle.
5. *Pentagonaster australis*.
Tasmania.
6. *Anthenea tuberculosa*.
Port Jackson. *Vide infra*.
7. *Asterina Gunnii*.
Tasmania.

* 5 and 7 were discovered by the Alert and will be described in the report on that collection made by that vessel.

8. *Asterina calcar.*
Port Jackson.
9. *Asteropsis vermicina.*
Port Jackson.
10. *Astropecten polyacanthus* (Young)
Port Jackson.
11. *Astropectinid?* Sp. nov.
Port Molle.
12. *Actaster insignis.* (Sladen, J. L. S. XVI., p. 200).
Port Jackson.

Anthenea tuberculosa : These are very fine specimens, and a comparison of their characters with those of the "type" teaches us that a comprehensive revision of this genus will have to be based on large series of specimens of very various sizes ; the genus is at present rather poorly represented in European Museums.

CLASS. OPHIUROIDEA.

1. *Pectinura stellata.*
Port Denison. *Vide infra.*
2. *Pectinura gorgonia.*
Sydney : Nelson's Bay, Port Stephens.
3. *Pectinura marmoratu.*
(?) "Queensland."
4. *Ophioglossus imbricatus.*
Port Denison.
5. *Ophioglypha multispira.*
Port Jackson.
6. *Ophiactis resiliens.*
Port Jackson : Nelson's Bay.

7. *Amphiura constricta*.
Port Jackson. *Vide infra*.
8. *Ophionereis schayeri*.
Sydney, Tasmania, Nelson's Bay.
9. *Ophiocoma scolopendima*.
Port Moresby, New Guinea, Port Denison.
10. *Ophiocoma erinaceus*.
Port Moresby. *Vide infra*.
11. *Ophiarthrum elegans*.
Thursday Island. Ugi.
12. *Ophiarthrum* sp.
Ugi.
13. *Ophiomastix annulosa*.
Ugi.
14. *Ophiothrix longipeda*.
Port Molle, Thursday Id.
15. *Ophiothrix coespitora*.
Port Jackson. *Vide infra*.
16. *Ophiothrix fumaria*.
Nelson's Bay, Port Stephens.
- 17-18. *Ophiothrix*. Sp. f.
Nelson's Bay, Port Stephens.
19. *Euryale aspera*.
Port Denison.

Pectinura stellata. I am inclined to think that this should form the type of a new genus.

Amphiura constricta. The present collection shows that these lately discovered species are very abundant in Port Jackson.

Ophiocoma erinaceus. The differences between this and *O. scolopendrina* have been very acutely detected by Mr. Lyman. (See his Challenger Report. S. V.)

Ophiothrix cæspitosa. This species is perhaps very variable, but the genus *Ophiothrix* will need the unreserved labour of many years before we can even hope to have its species satisfactorily marshalled. I would particularly direct the attention of the Australian naturalists to the constancy, variability, and patterns of the colour-markings of the species of this genus.

CLASS. ECHNOIDEA

1. *Phyllacanthus imperialis*.
" Australian Coast."
2. *P. tenuispinus*.
Port Jackson. *Vide infra*.
3. *Phyllacanthus*, sp.
Port Jackson. *Vide infra*.
4. *Goniocidaris geranioides*.
S. E. Australia.
5. *Goniocidaris tubaria*.
Port Jackson—5 fms.
6. *Diadema setosum*.
Port Denison.
7. *Centrostephanus rodgersii*. (Young.)
Port Jackson.
8. *Echinothrix calamaria*.
Solomon Islands.
9. *Salmacis alexandri*. *Vide infra*.
Port Jackson, Sow and Pig's Reef.

10. *S. bicolor*. *Vide infra*.
Port Denison.
11. *Salmacis sulcata*.
Ugi Islands.
12. *Salmacis dussumieri*.
Port Denison.
13. *Amblypneustes ovum*.
Port Jackson.
14. *Amblypneustes*, sp. *Vide infra*.
Port Jackson.
15. *Strongylocentrotus erythrogrammus*. *Vide infra*.
Port Stephens.
16. *S. tuberculatus*.
Lord Howe's Island.
17. *Sphærechinus australiae*.
S. E. Coast of Australia.
18. *Echinostrephus molare*.
Lord Howe's Island.
19. *Echinometra lacunter*.
Lord Howe's Island; Ugi.
20. *Heterocentrotus mammelatus*.
Ugi.
21. *Echinanthus testudinarius*.
Port Denison, Port Jackson.
22. *Echinanthus tumidus*.
Hab? *Vide infra*.
23. *Laganum decagonale*.
Port Denison, Port Molle.

24. *Laganum peronii*.
Port Jackson. *Vide infra*.
25. *Arachnoides placenta*.
Port Denison.
26. *Maretia planulata*.
Port Jackson, Port Stephens.
27. *Lovenia elongata*.
Port Jackson.
28. *Breynia australasica*.
Lord Howe's Island. *Vide infra*.
29. *Echinocardium australe*.
Port Jackson.
30. *Hemiaster apicatus*.
Port Jackson. *Vide infra*.

Phyllacanthus tenuispinus. This is perhaps a MSS. error for *Phyllacanthus parvispinus* of Tenison-Woods, or it is perhaps the MSS. name of some new and as yet undescribed species.

The specimens present sufficient points of resemblance to certain points of Mr. Wood's descriptions* to give some support to the former view; on the other hand that description deals with what in one important point is a Goniocidarid rather than a Phyllacanthid character—no other *Phyllacanthus*, to my knowledge, having its longitudinal axis longer than the diameter of the test. I note so many misprints in Mr. Wood's paper that I am inclined to suppose that numbers of millimetres of height and diameter have been reversed.

In the next place, the specimens now being studied have only seven primary tubercles in each vertical row, while Mr. Wood's specimen has eight,

This difficulty, however, I think I can remove.

* Proc. L.S., N.S.W., IV., p. 286.

Though Mr. Tenison-Woods would appear to have an extraordinary familiarity and acquaintance with Echinoidea, second possibly only to that of Prof. Alex. Agassiz, with whose description and views his own so often and so curiously agree, yet he is, I think, mistaken in imagining that there is any mysterious constancy in the number of the primary tubercles; when there are but few tubercles, that is where the primary plates are large we easily count, and sharply note the number of such bosses; but with an increase in the size of the test, there must come some increase in the number of the plates. In other words, because the largest specimen (75 mm.* in diameter) known to-day has only 6 tubercles, it by no means follows that a specimen of the same species, found to-morrow with a diameter of 100 mm. with not have more.

At this moment a specimen of *Phyllacanthus imperialis* lying before me has a diameter of 80mm., and seven primary tubercles in a vertical row.

A specimen of 60 mm. in diameter may therefore well have only seven primary tubercles, and yet belong to the same species as the test with 100 mm. for diameter and eight primary tubercles.

I have followed Prof. Agassiz and Mr. Tenison-Woods in the term *Phyllacanthus*, but I have to say that I have done this rather because I have here wished to keep apart from all disputed questions, and not because I do not myself recognise a force in de Loriol's plea in favour of *Rhabdocidaris*. (See Palæontographica. Vol. XXX. pt. II., p. 6.

"*Phyllacanthus*. Sp. Nov. (unique.)"—A specimen bearing the above remark cannot be passed over without notice. It will exhibit to the visitors of the Australian Museum an example of what may well be called symbiosis, for the well developed Polyzoan colonies must afford protection to the species, and the small parasitic *Balani* gain all the food they want in the currents that stream round so much larger an organism.

*Strangely enough the American and the Australian Naturalist fix on just the same number of mm.

Mr. Ridley tells me that there are representatives of three Polyzoan genera here present—*Allopora*, *Lepralia*, (S. Str.) and *Retepora*.

Salmacis alexandri.—In the Proc. Zool. Soc., London, for the year 1880, I have (p. 433) pointed out that the *S. globator* of Agassiz is not the *S. globator* of Agassiz *fil.*; the former that I there distinguished and figured as form *B.*, is, no doubt, the true *S. globator*. The other and much more common species must have a new name, and in my forthcoming report on the Echinoidea of H.M.S. Alert, I propose to speak of it as *S. alexandri*.

Salmacis bicolor.—The abactinal spines of this species may be unicolor.

Amblypneustes, sp.—As specimens of this genus are beginning to accumulate, fresh doubts and difficulties arise as to the specific characters of the forms belonging to it; and I must take this opportunity to ask my friends in Australia, “the hot-bed of the genus,” to let me have a large number of specimens from various localities and in all kinds of stages. I may, at this time, beg of those into whose hands fresh specimens may come to attempt to set at rest the difficulties which are connected with the differences in the size of the genital pores in specimens of *A. griseus* and *A. formosus*. Have we here different species, different races, or different sexes?*

Strongylocentrotus erythrogrammus.—Mr. Woods is both historically and etymologically wrong in writing the specific name *erythrogrammus*.

Laganum peronii.—Mr. Woods writes (Op. cit. II. p. 170) “Genus, *Peronella*, Gray, 1855; as he gives no reference I may assume that he refers to Dr. J. E. Gray’s catalogue of the recent Echinida published in 1855; but, further, in giving no reference he gives no page, and I cannot, therefore, guess where to look for Dr. Gray’s definition of the genus. It is not, at any rate, mentioned in the “Synopsis of Genera,” on p. 3.

* Cf. P. Z. S., 1880, pp. 436-7, and pl. XLI., fig. 3-6.

A somewhat similar statement with regard to Dr. Gray has been made by Mr. Alex. Agassiz, and with this I dealt in the early part of last year,* when I took occasion to point out the inconstancy and unimportance of the characters which were regarded as distinguishing *Peronella* from *Laganum*.

Breynia australasica.—When the specimens of this species attain a great size their general appearance is not a little altered, owing to the want of proportionate increase in the long abactinal spines, which, no doubt, are more needed by younger than by older and stouter individuals.

Hemiaster apicatus.—The specimens in which Mr. Tenison-Woods formed his new species of *Hemiaster* were without spines; the single specimen now before me is, I fancy, a representative of that species; as it is well provided with spines I stand aside to allow Mr. Woods to complete its description.

CLASS. HOLOTHUROIDEA.

Unfortunately many of the species of this group are represented by single individuals only, and as the whole of the Holothurian collection in the British Museum has not as yet been specifically determined, the list is unsatisfactory and incomplete.

1. *Colochirus tuberculosus*.

Port Denison.

2. *Colochirus australis*.

Port Jackson.

3. *Actinocucumis difficilis*.

[No locality: the Alert collected it in Torres Straits.]

4. *Thyone buccalis*. *Vide infra*.

Port Denison.

5. *Orcula perspicillum*.

Port Denison, Port Stephens.

*Ann. N. H. (5) XI., p. 130, etc.

6. *Stereoderma validum*, Bell, *vide infra*.

Port Jackson.

7. *Stichopus*, sp., (allied to *S. chloronotus*, but apparently distinguished by the very long Polian vesicle.)

8. *Holothuria pulla*. *Vide infra*.

Ugi.

Thyone buccalis.—I am very doubtful as to the correctness of this determination. Stimpson unfortunately gives no details as to the characters of the spicules of the species, which was found by him in Port Jackson.

Stereoderma validum.—This species is extraordinarily abundant in Port Jackson. It would be well to examine carefully living specimens side by side with Quoy and Gaimard's figures of *Holothuria spinosa*, which they report to be very common in the same place. I have carefully considered the subject with Mr. Ramsay, who was at first inclined to think that the species might be identical, and we have come to the conclusion that, abundant as the species is, it has never yet been described. It now remains for the Zoologists of Port Jackson to rediscover Quoy and Gaimard's, *H. spinosa*.

Holothuria pulla.—I am a little doubtful as to the accuracy of this determination.

British Museum, April 30, 1884.

NOTES AND EXHIBITS.

Mr. Macleay exhibited for Mr. Wilkinson a very peculiar conical stone implement, found by Mr. A. G. Brook, of Gondoblui Station, embedded in the soil on the plains near the Queensland border, between the Narran and Barwon Rivers. The note accompanying the exhibit states that there are no rocks near that locality, and that the old aboriginals of the district know nothing about it. The stone is composed of a soft fine white sandstone, is